

Mechanically Attached TPO Roofing JHA

Worked instructional example

Work and worksite

A roofing crew will mechanically fasten specified TPO membrane and heat-weld its laps on a released low-slope commercial roof. Deck, insulation and cover board have already been accepted for this system. This fictional learning example describes planned controls; it records no actual inspection or work authorization.

- The approved attachment layout, membrane, fasteners and welding criteria match the actual roof assembly.
- Edge/opening protection, roof-load limits, electrical supply and the site's applicable hot-work/fire controls are established.
- EPDM adhesive seaming, PVC, induction attachment and installing insulation or cover board are excluded.

Questions before work

- What confirms fastener locations, deck suitability and perimeter details?
- How will welding settings be verified as conditions change?
- Where can a hot welder be parked without exposing people or materials?

Task Hazard Control

1 Accept the roof assembly

Hazard: Unsuitable substrate or loading can cause falls, fastening failure or roof damage.

Control: Roofing lead confirms the released deck, insulation and attachment design. Walk the protected route, identify load limits and keep openings/edges controlled before membrane deliveries.

Verification: Lead compares the roof handover with the approved system details.

Reasoning: A membrane installation starts with its receiving assembly.

2 Stage and lay membrane

Hazard: Loose rolls or wind-lifted sheets can strike or pull workers toward an edge.

Control: Stage rolls within roof-load limits and secure materials against movement. Lay only the manageable area in the planned sequence, maintaining protected positions and clear escape/access routes.

Verification: Foreperson monitors wind and sheet control during rollout.

Reasoning: An unfastened sheet can become a large moving surface.

3 Install mechanical attachment

Hazard: Fasteners can strike concealed services or fail in an unsuitable deck.

Control: Use released fastening locations and the specified plates/fasteners and spacing. Follow the approved system installation and required substrate checks; stop for unexpected deck response instead of adding improvised fasteners.

Verification: Installer records the required attachment checks against current details.

Reasoning: The attachment design carries roof-system loads.

Complete the work and hand over

4 Set up and verify welding

Hazard: Hot air, electrical faults or incorrect settings can burn workers or produce defective seams.

Control: Inspect welder and supply, arrange safe hot-tool parking and fire controls, and make the system-required test weld. Evaluate it by the manufacturer's cooling and acceptance method; repeat as required when conditions change.

Verification: Assigned welder records actual test results before production seams.

Reasoning: A dial setting from another roof is not a verified weld.

5 Weld and inspect laps

Hazard: A hot nozzle can burn workers; unchecked seams can remain open.

Control: Follow the actual system's heat-welding method with people clear of the hot tool and cords. Allow the prescribed cooling, probe/test seams under its instructions and repair/recheck deficiencies before handover.

Verification: Welder and lead verify completed seams and identify unresolved areas.

Reasoning: Inspection timing matters because warm seams can be damaged.

6 Secure and hand over

Hazard: Hot equipment or unsecured membrane can expose the next crew.

Control: Complete required daily seam closeout, cool and secure welders and restrain unfinished work against weather. Communicate incomplete attachment, seams and roof restrictions to the receiving lead.

Verification: Foreperson records daily closeout and remaining actions.

Reasoning: The shift ends with both hot-tool and membrane controls.

Pause and reassess

- Failed test weld, changed conditions or recurring seam defects.
- Unexpected fastening response, deck/service uncertainty or system mismatch.
- Wind control, roof protection or hot-tool/electrical controls fail.

Improve the controls

Needs improvement: Work carefully and wear PPE.

More useful: Use released fastening locations and the specified plates/fasteners and spacing. Follow the approved system installation and required substrate checks; stop for unexpected deck response instead of adding improvised fasteners.

Needs improvement: Check that everything is ready.

More useful: Roofing lead confirms the released deck, insulation and attachment design. Walk the protected route, identify load limits and keep openings/edges controlled before membrane deliveries.

Decisions that change the analysis

Can the EPDM seam procedure be used for TPO?

No. This TPO system uses mechanical attachment and manufacturer-defined heat welds. EPDM adhesive and tape instructions do not establish TPO welding settings, cooling times or seam acceptance.

What must the crew record for actual use?

Identify the actual equipment and work boundaries, responsible people, applicable criteria, inspection findings and open actions. Resolve changes with affected crews and obtain required project authorization before work.

Training needs

- System-specific mechanical attachment and demonstrated test-weld/seam-verification method.
- Roof fall/opening protection, electrical supply and safe hot-tool handling instruction.

Confirm applicable qualifications and actual training evidence for the people assigned. Related toolbox talks support discussion; they do not establish competence.

References and adaptation

Carlisle Test welds and seam probing

<https://www.carlisesyntec.com/en/Resources/Media/Blog%20Landing%20Page/TecTopics/2023/03/21/Focus%20on%20Test%20Welds%20and%20Seam%20Probing>

OSHA 1926.501 Duty to have fall protection

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.501>

OSHA 1926.404 Wiring design and protection

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.404>

References reviewed October 9, 2026. Use actual equipment and product instructions, project design and site requirements. This instructional example supplies no actual inspection results, signatures or work approval.